Bridge converting movement into electrical energy ('' bridge '').

DESCRIPTION

Cross-Reference to Canadian application for Bridge Converting Movement into Electrical Energy

[Para 1] This patent application is related to a Patent Application in Canada. The title of this application is : Bridge converting movement into electrical energy. The number of the Canadian Patent application is : 2 446 783. The filing date of this application is October 27th, 2003.

Background of the Invention

[Para 2] This invention relates to the recuperation of the loss of energy of weights, vehicles, cars or trucks ('' vehicles '') going down a hill or decelerating, in order to produce rotation and ultimately, generate electricity. This is done with small modules of bridge that could be added to existing roads

Brief summary of the Invention

[Para 3] When vehicles go down a hill or decelerate, they loose energy. Today, without my invention, the loss of energy is dissipated in the brakes, in friction, etc... More or less, without my invention, all this energy goes in useless works (creation of heat and dusts from brakes, etc...). By simply adding modules of bridges to existing roads, it is possible to recuperate this energy and convert it into something more useful.

Brief description of the several views of the drawings

[Para 4] In drawings which illustrate embodiments of the invention, Figure 1 is the demonstration that linear movement can be translated into rotation with

an example of a motor with 4 cylinders motor, Figure 2 side view of figure 1, showing the functioning of the gravitational motor, Electrical Diagram 1 is an electrical description of the invention, Figure 3 is a side view of the invention (with a 4 cylinder motor), Figure 4 top view of the invention (with a 4 cylinder motor), figure 5 is a side view of the bridge showing the details of the road sections that will be moving, figure 6 is a top view of one road segment.

Detailed description of the Invention

[Para 5] With the bridge, this energy will be taken off the vehicles, when it goes down a hill or decelerates, and converted into useful work (electrical energy, etc...). To compare it to hydro generation, just think of a river of vehicles instead of a river of water. In Hydro Generation, they take water that goes down a hill and convert the loss of potential energy of water into a rotation. With the rotation, they produce electricity. My invention uses a bridge to convert the loss of energy of vehicles into a rotation and ultimately, into electricity. Not only this is environmentally interesting but it produces electricity where the demand is located. In other words, it will generate more downtown Montreal than in Baie Comeau (more in New York City than in Milford, Me), because there are more vehicles that goes down a hill in Montreal than in Baie Comeau. There are also more vehicles that need to decelerate in Montreal than in Baie Comeau, for example ! This also means that there are less needs for Transmission Lines and that the cost of generating electricity is very low compare to other form of generations available today.

[Para 6] So, in order to take advantage of this loss of energy, this invention recuperate this loss of energy and use it to generate a rotation that will be ultimately used to generate electricity. To do that, we give an example where we separate the road in 4 segments in order to imitate the functioning of a motor with 4 cylinders (this is only an example and we could have done it with a 6 cylinders, 8 cylinders or 12 cylinders motor, etc...). So when vehicles pass on each segment, they press the piston down in the cylinder of the bridge. So, each time they pass on a road segment, it activate the piston in

the cylinder. Obviously, this creates the rotation in discrete steps. Ultimately, this rotation will be translated into electrical energy. Just think that the crankshaft is coupled to a gear like in a mountain bike, for example.

[Para 7] So, the principle is that we can take advantage of the fact that vehicles move and that it is possible to transform their movement (loss of energy) in electrical energy, when they go down a hill or decelerate.

[Para 8] We can define a good example of this Bridge converting movement into electrical energy:

[Para 9] The application is with vehicles that go down the hill or decelerate. When we separate the road into multiples parts (as shown in Figure 1), it is possible to convert the movement of the automotives vehicles (or any other type of vehicles) into a rotation that can be used to generate electricity. This would have the effect to save the braking systems of the car and generate useful energy. So, as we can see in Figure 1, it is possible to see that the movement of the road parts is similar to the movement of pistons in a motor. From this point, it is obvious that a rotation can be generated with a motor made for this application (see Figure 2) and then we can convert this rotation into electrical power

[Para 10] So, when vehicles go down the hill or decelerate, it generates electrical energy with their movements. Since their speed may vary, we will generate in AC but we will rectify in DC and inverse at the same frequency as the electrical system that we will connect to (see electrical diagram 1). It will be interesting to use devices such as FACTS (Flexible AC Transmission Systems) or HVDC to regulate the power output of our generation system to the electrical grid and compensate for the fact that cars do not pass regularly and constantly.

[Para 11] This form of generation could be used in all the countries and in all applications where vehicles go down a hill or decelerate and we can take advantage of their movement. However, for countries where snow is expected, there has to be modifications to take into account specific conditions related to winter.

[Para 12] The preferred practice would be in big cities, on huge highways, with a nice slope (or near stop signs, at limits between different speed zones) where vehicles go down the hill or decelerate. Then, we can take advantage of their waste of energy and convert it into electricity. For example, we can think of any big city in the planet, but lets state Los Angeles, New York or Montreal. Lets think about the Tunnel LH Lafontaine, going out of Montreal. With the traffic in this highway, we can generate a lot of MegaWatts of electrical power.

[Para 13] This form of electrical generation is more useful than other existing alternative forms of generation (like wind farms for example) in the sense that it will have a better availability and predictability because it is dependant upon traffic in urban areas and this is well known and predictable. Also, one can easily imagine the quantity of energy contained in a traffic period on Decarie Highway or Highway 20 or Tunnel LH Lafontaine ! The other fact is that the loss of energy of moving vehicles is free ! From an environmental perspective, this is a good project since there is no negative impact on environment. One can imagine that we have to brake when we go down a hill but with this new system, it will require less braking than before.

[Para 14] Another advantage of this invention is that this bridge converter could be built remotely and have a modular installation. Due to that, it will easily be moved to other locations and very easy to maintain since we can remove a module and replace it with another one while we do maintenance work !

[Para 15] Also, another advantage of this invention is that the generation will take place very close to urban areas. So, the needs for transmission of electricity will be less important than with hydro electricity or wind generation, for example.

[Para 16] Finally, you will find that this invention has been made with modules that can easily be added to an existing road. The modularity of this invention is such that each part is interchangeable, similar or identical to its neighbors. So, everything is interchangeable and easy to maintain.

[Para 17] It is clear that this invention will have to take advantage of the trucks that go down the hills or decelerate, although cars and bus and

subways will be good targets too. The only limitation of this invention would have been the accumulation of snow on the moving part of the road. However, as stated before, we can avoid this problem. My calculations show that for the application with a 4 cylinders motor, we can obtain an average of at least 140 kW per motor. However, this will vary for each application (trucks or cars or metro or landing planes ???).

[Para 18] Also, one of the limitation of this invention is the displacement of the piston. In other words, the more displacement we have, the more bumpier is the road for the vehicles.

[Para 19] Finally, the more we reduce the width of moving roads parts, the more energy that we produce. It is the inverse for the displacement of the pistons. The more displacement we have, the more energy we will produce.

[Para 20] To my knowledge, this system has never been tested under winter climate. However, a dome covering the installations or road protection or any other good ideas is supposed to protect our electrical energy generating system against accumulation of snow, and thus, against machines that remove or shuffle snow.

Declaration

[Para 21] I, Alain Painchaud, declare that I am the inventor of this Bridge. I am a Canadian Citizen (passport # MJ705466), born in Montreal, Canada, December 3rd of 1968. I have already filed a patent application (# 2 446 783)on October 27th, 2003 at the CIPO in Canada. My address is 724, Sainte Marie, Quebec, Quebec, Canada, G1R3G8.